

**ANALYTICAL RESULTS**

Prepared for:

Langan  
500 Hyde Park  
Doylestown PA 18901

215-348-7101

Prepared by:

Lancaster Laboratories  
2425 New Holland Pike  
Lancaster, PA 17605-2425**SAMPLE GROUP**

The sample group for this submittal is 942136. Samples arrived at the laboratory on Wednesday, May 04, 2005. The PO# for this group is SUNOCO PHILLY REFINER.

**Client Description**

S119D-050305 Grab Water Sample  
S119-050305 Grab Water Sample  
S40-050305 Grab Water Sample  
S120-050305 Grab Water Sample  
S39-050305 Grab Water Sample  
S122-050305 Grab Water Sample  
S38D-050305 Grab Water Sample  
S38I-050305 Grab Water Sample  
S38-050305 Grab Water Sample  
Trip\_Blank Water Sample

**Lancaster Labs Number**

4517633  
4517634  
4517635  
4517636  
4517637  
4517638  
4517639  
4517640  
4517641  
4517642

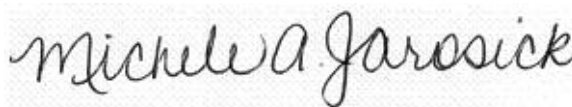
ELECTRONIC      SUN: Aquaterra Tech.  
COPY TO  
1 COPY TO      LL  
1 COPY TO      Langan  
ELECTRONIC      Langan  
COPY TO

Attn: Brad Spancake

Attn: Angela Miller  
Attn: Jason Hanna  
Attn: Dennis Webster

Questions? Contact your Client Services Representative  
Angela M Miller at (717) 656-2300.

Respectfully Submitted,



Michele A. Jarosick  
Senior Chemist, Coordinator

Lancaster Laboratories Sample No. WW 4517633

S119D-050305 Grab Water Sample  
SUN: Philadelphia Refinery AOI-4

Collected: 05/03/2005 11:40 by MBS

Account Number: 10132

Submitted: 05/04/2005 16:35  
Reported: 05/11/2005 at 16:18  
Discard: 06/11/2005

Langan  
500 Hyde Park  
Doylestown PA 18901

S119D

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Units	Dilution Factor
06035	Lead	7439-92-1	< 0.0010	0.0010	0.00021	mg/l	1
07879	EDB in Wastewater						
01087	Ethylene dibromide	106-93-4	< 0.029	0.029	0.0096	ug/l	1
07805	PAHs in Water by GC/MS						
03947	Naphthalene	91-20-3	< 10.	10.	1.	ug/l	1
03956	Fluorene	86-73-7	< 10.	10.	1.	ug/l	1
03963	Phenanthrene	85-01-8	< 10.	10.	1.	ug/l	1
03967	Pyrene	129-00-0	< 10.	10.	1.	ug/l	1
03971	Chrysene	218-01-9	< 10.	10.	1.	ug/l	1
02302	UST-Waters by 8260B						
02010	Methyl Tertiary Butyl Ether	1634-04-4	< 5.	5.	0.5	ug/l	1
05401	Benzene	71-43-2	< 5.	5.	0.5	ug/l	1
05402	1,2-Dichloroethane	107-06-2	< 5.	5.	1.	ug/l	1
05407	Toluene	108-88-3	< 5.	5.	0.7	ug/l	1
05415	Ethylbenzene	100-41-4	< 5.	5.	0.8	ug/l	1
05420	Isopropylbenzene	98-82-8	< 5.	5.	1.	ug/l	1
06310	Xylene (Total)	1330-20-7	< 5.	5.	0.8	ug/l	1

Commonwealth of Pennsylvania Lab Certification No. 36-037  
This sample was filtered in the lab for dissolved metals.

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	05/06/2005 21:07	David K Beck	1
07879	EDB in Wastewater	SW-846 8011	1	05/06/2005 12:23	James H Place	1
07805	PAHs in Water by GC/MS	SW-846 8270C	1	05/07/2005 02:03	Jolene M Graham	1
02302	UST-Waters by 8260B	SW-846 8260B	1	05/08/2005 12:21	Jason M Long	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	05/08/2005 12:21	Jason M Long	n.a.
06050	ICP/MS SW-846 Water	SW-846 3010A Mod.	1	05/05/2005 18:55	James L Mertz	1
07786	EDB Extraction	SW-846 8011	1	05/05/2005 19:08	Amanda W Herr	1
07807	BNA Water Extraction	SW-846 3510C	1	05/06/2005 07:00	Mark P Mastropietro	1

\*=This limit was used in the evaluation of the final result

**Lancaster Laboratories Sample No. WW 4517633**

**S119D-050305 Grab Water Sample  
SUN: Philadelphia Refinery AOI-4**

Collected: 05/03/2005 11:40 by MBS

Account Number: 10132

Submitted: 05/04/2005 16:35  
Reported: 05/11/2005 at 16:18  
Discard: 06/11/2005

Langan  
500 Hyde Park  
Doylestown PA 18901

S119D

**Lancaster Laboratories Sample No. WW 4517634**

**S119-050305 Grab Water Sample**  
**SUN: Philadelphia Refinery AOI-4**

Collected: 05/03/2005 12:00 by MBS

Account Number: 10132

Submitted: 05/04/2005 16:35  
 Reported: 05/11/2005 at 16:18  
 Discard: 06/11/2005

Langan  
 500 Hyde Park  
 Doylestown PA 18901

S-119

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Units	Dilution Factor
06035	Lead	7439-92-1	< 0.0010	0.0010	0.00021	mg/l	1
07879	EDB in Wastewater						
01087	Ethylene dibromide	106-93-4	< 0.028	0.028	0.0095	ug/l	1
07805	PAHs in Water by GC/MS						
03947	Naphthalene	91-20-3	< 10.	10.	1.	ug/l	1
03956	Fluorene	86-73-7	< 10.	10.	1.	ug/l	1
03963	Phenanthrene	85-01-8	< 10.	10.	1.	ug/l	1
03967	Pyrene	129-00-0	< 10.	10.	1.	ug/l	1
03971	Chrysene	218-01-9	< 10.	10.	1.	ug/l	1
02302	UST-Waters by 8260B						
02010	Methyl Tertiary Butyl Ether	1634-04-4	< 5.	5.	0.5	ug/l	1
05401	Benzene	71-43-2	5.	5.	0.5	ug/l	1
05402	1,2-Dichloroethane	107-06-2	< 5.	5.	1.	ug/l	1
05407	Toluene	108-88-3	< 5.	5.	0.7	ug/l	1
05415	Ethylbenzene	100-41-4	< 5.	5.	0.8	ug/l	1
05420	Isopropylbenzene	98-82-8	< 5.	5.	1.	ug/l	1
06310	Xylene (Total)	1330-20-7	< 5.	5.	0.8	ug/l	1

Commonwealth of Pennsylvania Lab Certification No. 36-037  
 This sample was filtered in the lab for dissolved metals.

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	05/06/2005 21:11	David K Beck	1
07879	EDB in Wastewater	SW-846 8011	1	05/06/2005 12:52	James H Place	1
07805	PAHs in Water by GC/MS	SW-846 8270C	1	05/07/2005 03:02	Jolene M Graham	1
02302	UST-Waters by 8260B	SW-846 8260B	1	05/08/2005 13:03	Jason M Long	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	05/08/2005 13:03	Jason M Long	n.a.
06050	ICP/MS SW-846 Water	SW-846 3010A Mod.	1	05/05/2005 18:55	James L Mertz	1
07786	EDB Extraction	SW-846 8011	1	05/05/2005 19:08	Amanda W Herr	1
07807	BNA Water Extraction	SW-846 3510C	1	05/06/2005 07:00	Mark P Mastropietro	1

\*=This limit was used in the evaluation of the final result

**Lancaster Laboratories Sample No. WW 4517634**

**S119-050305 Grab Water Sample**

**SUN: Philadelphia Refinery AOI-4**

Collected: 05/03/2005 12:00 by MBS

Account Number: 10132

Submitted: 05/04/2005 16:35

Langan

Reported: 05/11/2005 at 16:18

500 Hyde Park

Discard: 06/11/2005

Doylestown PA 18901

S-119

Lancaster Laboratories Sample No. WW 4517635

S40-050305 Grab Water Sample  
SUN: Philadelphia Refinery AOI-4

Collected: 05/03/2005 12:15 by MBS

Account Number: 10132

Submitted: 05/04/2005 16:35  
Reported: 05/11/2005 at 16:18  
Discard: 06/11/2005

Langan  
500 Hyde Park  
Doylestown PA 18901

S-040

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Units	Dilution Factor
06035	Lead	7439-92-1	< 0.0010	0.0010	0.00021	mg/l	1
07879	EDB in Wastewater						
01087	Ethylene dibromide	106-93-4	< 0.030	0.030	0.0099	ug/l	1
07805	PAHs in Water by GC/MS						
03947	Naphthalene	91-20-3	< 10.	10.	1.	ug/l	1
03956	Fluorene	86-73-7	< 10.	10.	1.	ug/l	1
03963	Phenanthrene	85-01-8	16.	10.	1.	ug/l	1
03967	Pyrene	129-00-0	< 10.	10.	1.	ug/l	1
03971	Chrysene	218-01-9	< 10.	10.	1.	ug/l	1
02302	UST-Waters by 8260B						
02010	Methyl Tertiary Butyl Ether	1634-04-4	< 5.	5.	0.5	ug/l	1
05401	Benzene	71-43-2	370.	25.	3.	ug/l	5
05402	1,2-Dichloroethane	107-06-2	< 5.	5.	1.	ug/l	1
05407	Toluene	108-88-3	14.	5.	0.7	ug/l	1
05415	Ethylbenzene	100-41-4	21.	5.	0.8	ug/l	1
05420	Isopropylbenzene	98-82-8	40.	5.	1.	ug/l	1
06310	Xylene (Total)	1330-20-7	10.	5.	0.8	ug/l	1

Commonwealth of Pennsylvania Lab Certification No. 36-037  
This sample was filtered in the lab for dissolved metals.

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	05/06/2005 21:15	David K Beck	1
07879	EDB in Wastewater	SW-846 8011	1	05/06/2005 13:22	James H Place	1
07805	PAHs in Water by GC/MS	SW-846 8270C	1	05/07/2005 04:01	Jolene M Graham	1
02302	UST-Waters by 8260B	SW-846 8260B	1	05/08/2005 13:25	Jason M Long	1
02302	UST-Waters by 8260B	SW-846 8260B	1	05/08/2005 13:46	Jason M Long	5
01163	GC/MS VOA Water Prep	SW-846 5030B	1	05/08/2005 13:25	Jason M Long	n.a.
01163	GC/MS VOA Water Prep	SW-846 5030B	2	05/08/2005 13:46	Jason M Long	n.a.
06050	ICP/MS SW-846 Water	SW-846 3010A Mod.	1	05/05/2005 18:55	James L Mertz	1

\*=This limit was used in the evaluation of the final result

**Lancaster Laboratories Sample No. WW 4517635**

**S40-050305 Grab Water Sample**

**SUN: Philadelphia Refinery AOI-4**

Collected: 05/03/2005 12:15 by MBS

Account Number: 10132

Submitted: 05/04/2005 16:35

Langan

Reported: 05/11/2005 at 16:18

500 Hyde Park

Discard: 06/11/2005

Doylestown PA 18901

S-040

07786	EDB Extraction	SW-846 8011	1	05/05/2005 19:08	Amanda W Herr	1
07807	BNA Water Extraction	SW-846 3510C	1	05/06/2005 07:00	Mark P Mastropietro	1



Lancaster Laboratories Sample No. WW 4517636

S120-050305 Grab Water Sample  
SUN: Philadelphia Refinery AOI-4

Collected: 05/03/2005 12:30 by MBS

Account Number: 10132

Submitted: 05/04/2005 16:35  
Reported: 05/11/2005 at 16:19  
Discard: 06/11/2005

Langan  
500 Hyde Park  
Doylestown PA 18901

S-120

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Units	Dilution Factor
06035	Lead	7439-92-1	< 0.0010	0.0010	0.00021	mg/l	1
07879	EDB in Wastewater						
01087	Ethylene dibromide	106-93-4	< 0.029	0.029	0.0098	ug/l	1
07805	PAHs in Water by GC/MS						
03947	Naphthalene	91-20-3	< 10.	10.	1.	ug/l	1
03956	Fluorene	86-73-7	< 10.	10.	1.	ug/l	1
03963	Phenanthrene	85-01-8	< 10.	10.	1.	ug/l	1
03967	Pyrene	129-00-0	< 10.	10.	1.	ug/l	1
03971	Chrysene	218-01-9	< 10.	10.	1.	ug/l	1
02302	UST-Waters by 8260B						
02010	Methyl Tertiary Butyl Ether	1634-04-4	< 5.	5.	0.5	ug/l	1
05401	Benzene	71-43-2	< 5.	5.	0.5	ug/l	1
05402	1,2-Dichloroethane	107-06-2	< 5.	5.	1.	ug/l	1
05407	Toluene	108-88-3	< 5.	5.	0.7	ug/l	1
05415	Ethylbenzene	100-41-4	< 5.	5.	0.8	ug/l	1
05420	Isopropylbenzene	98-82-8	< 5.	5.	1.	ug/l	1
06310	Xylene (Total)	1330-20-7	< 5.	5.	0.8	ug/l	1

Commonwealth of Pennsylvania Lab Certification No. 36-037  
This sample was filtered in the lab for dissolved metals.

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	05/06/2005 21:19	David K Beck	1
07879	EDB in Wastewater	SW-846 8011	1	05/06/2005 14:21	James H Place	1
07805	PAHs in Water by GC/MS	SW-846 8270C	1	05/09/2005 11:06	Joseph M Gambler	1
02302	UST-Waters by 8260B	SW-846 8260B	1	05/08/2005 14:07	Jason M Long	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	05/08/2005 14:07	Jason M Long	n.a.
06050	ICP/MS SW-846 Water	SW-846 3010A Mod.	1	05/05/2005 18:55	James L Mertz	1
07786	EDB Extraction	SW-846 8011	1	05/05/2005 19:08	Amanda W Herr	1
07807	BNA Water Extraction	SW-846 3510C	1	05/06/2005 07:00	Mark P Mastropietro	1

\*=This limit was used in the evaluation of the final result

**Lancaster Laboratories Sample No. WW 4517636**

**S120-050305 Grab Water Sample**

**SUN: Philadelphia Refinery AOI-4**

Collected: 05/03/2005 12:30 by MBS

Account Number: 10132

Submitted: 05/04/2005 16:35

Langan

Reported: 05/11/2005 at 16:19

500 Hyde Park

Discard: 06/11/2005

Doylestown PA 18901

S-120

Lancaster Laboratories Sample No. WW 4517637

S39-050305 Grab Water Sample  
SUN: Philadelphia Refinery AOI-4

Collected: 05/03/2005 12:45 by MBS

Account Number: 10132

Submitted: 05/04/2005 16:35  
Reported: 05/11/2005 at 16:19  
Discard: 06/11/2005

Langan  
500 Hyde Park  
Doylestown PA 18901

S-039

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Units	Dilution Factor
06035	Lead	7439-92-1	< 0.0010	0.0010	0.00021	mg/l	1
07879	EDB in Wastewater						
01087	Ethylene dibromide	106-93-4	< 0.029	0.029	0.0097	ug/l	1
07805	PAHs in Water by GC/MS						
03947	Naphthalene	91-20-3	< 10.	10.	1.	ug/l	1
03956	Fluorene	86-73-7	< 10.	10.	1.	ug/l	1
03963	Phenanthrene	85-01-8	< 10.	10.	1.	ug/l	1
03967	Pyrene	129-00-0	< 10.	10.	1.	ug/l	1
03971	Chrysene	218-01-9	< 10.	10.	1.	ug/l	1
02302	UST-Waters by 8260B						
02010	Methyl Tertiary Butyl Ether	1634-04-4	< 5.	5.	0.5	ug/l	1
05401	Benzene	71-43-2	< 5.	5.	0.5	ug/l	1
05402	1,2-Dichloroethane	107-06-2	< 5.	5.	1.	ug/l	1
05407	Toluene	108-88-3	< 5.	5.	0.7	ug/l	1
05415	Ethylbenzene	100-41-4	< 5.	5.	0.8	ug/l	1
05420	Isopropylbenzene	98-82-8	< 5.	5.	1.	ug/l	1
06310	Xylene (Total)	1330-20-7	< 5.	5.	0.8	ug/l	1

Commonwealth of Pennsylvania Lab Certification No. 36-037  
This sample was filtered in the lab for dissolved metals.

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	05/06/2005 21:22	David K Beck	1
07879	EDB in Wastewater	SW-846 8011	1	05/06/2005 14:51	James H Place	1
07805	PAHs in Water by GC/MS	SW-846 8270C	1	05/09/2005 12:05	Joseph M Gambler	1
02302	UST-Waters by 8260B	SW-846 8260B	1	05/08/2005 14:28	Jason M Long	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	05/08/2005 14:28	Jason M Long	n.a.
06050	ICP/MS SW-846 Water	SW-846 3010A Mod.	1	05/05/2005 18:55	James L Mertz	1
07786	EDB Extraction	SW-846 8011	1	05/05/2005 19:08	Amanda W Herr	1
07807	BNA Water Extraction	SW-846 3510C	1	05/06/2005 07:00	Mark P Mastropietro	1

\*=This limit was used in the evaluation of the final result

**Lancaster Laboratories Sample No. WW 4517637**

**S39-050305 Grab Water Sample**

**SUN: Philadelphia Refinery AOI-4**

Collected: 05/03/2005 12:45 by MBS

Account Number: 10132

Submitted: 05/04/2005 16:35

Langan

Reported: 05/11/2005 at 16:19

500 Hyde Park

Discard: 06/11/2005

Doylestown PA 18901

S-039

Lancaster Laboratories Sample No. WW 4517638

S122-050305 Grab Water Sample  
SUN: Philadelphia Refinery AOI-4

Collected: 05/03/2005 13:00 by MBS

Account Number: 10132

Submitted: 05/04/2005 16:35  
Reported: 05/11/2005 at 16:19  
Discard: 06/11/2005

Langan  
500 Hyde Park  
Doylestown PA 18901

S-122

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Units	Dilution Factor
06035	Lead	7439-92-1	< 0.0010	0.0010	0.00021	mg/l	1
07879	EDB in Wastewater						
01087	Ethylene dibromide	106-93-4	< 0.029	0.029	0.0096	ug/l	1
07805	PAHs in Water by GC/MS						
03947	Naphthalene	91-20-3	< 10.	10.	1.	ug/l	1
03956	Fluorene	86-73-7	< 10.	10.	1.	ug/l	1
03963	Phenanthrene	85-01-8	< 10.	10.	1.	ug/l	1
03967	Pyrene	129-00-0	< 10.	10.	1.	ug/l	1
03971	Chrysene	218-01-9	< 10.	10.	1.	ug/l	1
02302	UST-Waters by 8260B						
02010	Methyl Tertiary Butyl Ether	1634-04-4	< 5.	5.	0.5	ug/l	1
05401	Benzene	71-43-2	< 5.	5.	0.5	ug/l	1
05402	1,2-Dichloroethane	107-06-2	< 5.	5.	1.	ug/l	1
05407	Toluene	108-88-3	< 5.	5.	0.7	ug/l	1
05415	Ethylbenzene	100-41-4	< 5.	5.	0.8	ug/l	1
05420	Isopropylbenzene	98-82-8	< 5.	5.	1.	ug/l	1
06310	Xylene (Total)	1330-20-7	< 5.	5.	0.8	ug/l	1

Commonwealth of Pennsylvania Lab Certification No. 36-037  
This sample was filtered in the lab for dissolved metals.

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	05/06/2005 21:26	David K Beck	1
07879	EDB in Wastewater	SW-846 8011	1	05/06/2005 15:21	James H Place	1
07805	PAHs in Water by GC/MS	SW-846 8270C	1	05/09/2005 13:03	Joseph M Gambler	1
02302	UST-Waters by 8260B	SW-846 8260B	1	05/08/2005 14:49	Jason M Long	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	05/08/2005 14:49	Jason M Long	n.a.
06050	ICP/MS SW-846 Water	SW-846 3010A Mod.	1	05/05/2005 18:55	James L Mertz	1
07786	EDB Extraction	SW-846 8011	1	05/05/2005 19:08	Amanda W Herr	1
07807	BNA Water Extraction	SW-846 3510C	1	05/06/2005 07:00	Mark P Mastropietro	1

\*=This limit was used in the evaluation of the final result

**Lancaster Laboratories Sample No. WW 4517638**

**S122-050305 Grab Water Sample**

**SUN: Philadelphia Refinery AOI-4**

Collected: 05/03/2005 13:00 by MBS

Account Number: 10132

Submitted: 05/04/2005 16:35

Langan

Reported: 05/11/2005 at 16:19

500 Hyde Park

Discard: 06/11/2005

Doylestown PA 18901

S-122

Lancaster Laboratories Sample No. WW 4517639

S38D-050305 Grab Water Sample  
SUN: Philadelphia Refinery AOI-4

Collected: 05/03/2005 13:15 by MBS

Account Number: 10132

Submitted: 05/04/2005 16:35  
Reported: 05/11/2005 at 16:19  
Discard: 06/11/2005

Langan  
500 Hyde Park  
Doylestown PA 18901

S-38D

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Units	Dilution Factor
06035	Lead	7439-92-1	< 0.0010	0.0010	0.00021	mg/l	1
07879	EDB in Wastewater						
01087	Ethylene dibromide	106-93-4	< 0.029	0.029	0.0097	ug/l	1
07805	PAHs in Water by GC/MS						
03947	Naphthalene	91-20-3	< 10.	10.	1.	ug/l	1
03956	Fluorene	86-73-7	< 10.	10.	1.	ug/l	1
03963	Phenanthrene	85-01-8	< 10.	10.	1.	ug/l	1
03967	Pyrene	129-00-0	< 10.	10.	1.	ug/l	1
03971	Chrysene	218-01-9	< 10.	10.	1.	ug/l	1
02302	UST-Waters by 8260B						
02010	Methyl Tertiary Butyl Ether	1634-04-4	< 5.	5.	0.5	ug/l	1
05401	Benzene	71-43-2	< 5.	5.	0.5	ug/l	1
05402	1,2-Dichloroethane	107-06-2	< 5.	5.	1.	ug/l	1
05407	Toluene	108-88-3	< 5.	5.	0.7	ug/l	1
05415	Ethylbenzene	100-41-4	< 5.	5.	0.8	ug/l	1
05420	Isopropylbenzene	98-82-8	< 5.	5.	1.	ug/l	1
06310	Xylene (Total)	1330-20-7	< 5.	5.	0.8	ug/l	1

Commonwealth of Pennsylvania Lab Certification No. 36-037  
This sample was filtered in the lab for dissolved metals.

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	05/06/2005 21:30	David K Beck	1
07879	EDB in Wastewater	SW-846 8011	1	05/06/2005 15:51	James H Place	1
07805	PAHs in Water by GC/MS	SW-846 8270C	1	05/09/2005 14:02	Joseph M Gambler	1
02302	UST-Waters by 8260B	SW-846 8260B	1	05/08/2005 15:11	Jason M Long	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	05/08/2005 15:11	Jason M Long	n.a.
06050	ICP/MS SW-846 Water	SW-846 3010A Mod.	1	05/05/2005 18:55	James L Mertz	1
07786	EDB Extraction	SW-846 8011	1	05/05/2005 19:08	Amanda W Herr	1
07807	BNA Water Extraction	SW-846 3510C	1	05/06/2005 07:00	Mark P Mastropietro	1

\*=This limit was used in the evaluation of the final result

**Lancaster Laboratories Sample No. WW 4517639**

**S38D-050305 Grab Water Sample**

**SUN: Philadelphia Refinery AOI-4**

Collected: 05/03/2005 13:15 by MBS

Account Number: 10132

Submitted: 05/04/2005 16:35

Langan

Reported: 05/11/2005 at 16:19

500 Hyde Park

Discard: 06/11/2005

Doylestown PA 18901

S-38D



Lancaster Laboratories Sample No. WW 4517640

S38I-050305 Grab Water Sample  
SUN: Philadelphia Refinery AOI-4

Collected: 05/03/2005 13:30 by MBS

Account Number: 10132

Submitted: 05/04/2005 16:35  
Reported: 05/11/2005 at 16:19  
Discard: 06/11/2005

Langan  
500 Hyde Park  
Doylestown PA 18901

S-38I

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Units	Dilution Factor
06035	Lead	7439-92-1	< 0.0010	0.0010	0.00021	mg/l	1
07879	EDB in Wastewater						
01087	Ethylene dibromide	106-93-4	< 0.029	0.029	0.0098	ug/l	1
07805	PAHs in Water by GC/MS						
03947	Naphthalene	91-20-3	< 10.	10.	1.	ug/l	1
03956	Fluorene	86-73-7	< 10.	10.	1.	ug/l	1
03963	Phenanthrene	85-01-8	< 10.	10.	1.	ug/l	1
03967	Pyrene	129-00-0	< 10.	10.	1.	ug/l	1
03971	Chrysene	218-01-9	< 10.	10.	1.	ug/l	1
02302	UST-Waters by 8260B						
02010	Methyl Tertiary Butyl Ether	1634-04-4	< 5.	5.	0.5	ug/l	1
05401	Benzene	71-43-2	< 5.	5.	0.5	ug/l	1
05402	1,2-Dichloroethane	107-06-2	< 5.	5.	1.	ug/l	1
05407	Toluene	108-88-3	< 5.	5.	0.7	ug/l	1
05415	Ethylbenzene	100-41-4	< 5.	5.	0.8	ug/l	1
05420	Isopropylbenzene	98-82-8	< 5.	5.	1.	ug/l	1
06310	Xylene (Total)	1330-20-7	< 5.	5.	0.8	ug/l	1

Commonwealth of Pennsylvania Lab Certification No. 36-037  
This sample was filtered in the lab for dissolved metals.

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	05/06/2005 21:33	David K Beck	1
07879	EDB in Wastewater	SW-846 8011	1	05/06/2005 16:21	James H Place	1
07805	PAHs in Water by GC/MS	SW-846 8270C	1	05/09/2005 15:01	Joseph M Gambler	1
02302	UST-Waters by 8260B	SW-846 8260B	1	05/08/2005 15:32	Jason M Long	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	05/08/2005 15:32	Jason M Long	n.a.
06050	ICP/MS SW-846 Water	SW-846 3010A Mod.	1	05/05/2005 18:55	James L Mertz	1
07786	EDB Extraction	SW-846 8011	1	05/05/2005 19:08	Amanda W Herr	1
07807	BNA Water Extraction	SW-846 3510C	1	05/06/2005 07:00	Mark P Mastropietro	1

\*=This limit was used in the evaluation of the final result

**Lancaster Laboratories Sample No. WW 4517640**

**S38I-050305 Grab Water Sample**

**SUN: Philadelphia Refinery AOI-4**

Collected: 05/03/2005 13:30 by MBS

Account Number: 10132

Submitted: 05/04/2005 16:35

Langan

Reported: 05/11/2005 at 16:19

500 Hyde Park

Discard: 06/11/2005

Doylestown PA 18901

S-38I

Lancaster Laboratories Sample No. WW 4517641

S38-050305 Grab Water Sample  
SUN: Philadelphia Refinery AOI-4

Collected: 05/03/2005 13:45 by MBS

Account Number: 10132

Submitted: 05/04/2005 16:35  
Reported: 05/11/2005 at 16:19  
Discard: 06/11/2005

Langan  
500 Hyde Park  
Doylestown PA 18901

S-038

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Units	Dilution Factor
06035	Lead	7439-92-1	< 0.0010	0.0010	0.00021	mg/l	1
07879	EDB in Wastewater						
01087	Ethylene dibromide	106-93-4	< 0.029	0.029	0.0097	ug/l	1
07805	PAHs in Water by GC/MS						
03947	Naphthalene	91-20-3	< 10.	10.	1.	ug/l	1
03956	Fluorene	86-73-7	< 10.	10.	1.	ug/l	1
03963	Phenanthrene	85-01-8	< 10.	10.	1.	ug/l	1
03967	Pyrene	129-00-0	< 10.	10.	1.	ug/l	1
03971	Chrysene	218-01-9	< 10.	10.	1.	ug/l	1
02302	UST-Waters by 8260B						
02010	Methyl Tertiary Butyl Ether	1634-04-4	< 5.	5.	0.5	ug/l	1
05401	Benzene	71-43-2	< 5.	5.	0.5	ug/l	1
05402	1,2-Dichloroethane	107-06-2	< 5.	5.	1.	ug/l	1
05407	Toluene	108-88-3	< 5.	5.	0.7	ug/l	1
05415	Ethylbenzene	100-41-4	< 5.	5.	0.8	ug/l	1
05420	Isopropylbenzene	98-82-8	< 5.	5.	1.	ug/l	1
06310	Xylene (Total)	1330-20-7	< 5.	5.	0.8	ug/l	1

Commonwealth of Pennsylvania Lab Certification No. 36-037  
This sample was filtered in the lab for dissolved metals.

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	05/06/2005 21:44	David K Beck	1
07879	EDB in Wastewater	SW-846 8011	1	05/06/2005 16:50	James H Place	1
07805	PAHs in Water by GC/MS	SW-846 8270C	1	05/09/2005 15:59	Joseph M Gambler	1
02302	UST-Waters by 8260B	SW-846 8260B	1	05/08/2005 15:53	Jason M Long	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	05/08/2005 15:53	Jason M Long	n.a.
06050	ICP/MS SW-846 Water	SW-846 3010A Mod.	1	05/05/2005 18:55	James L Mertz	1
07786	EDB Extraction	SW-846 8011	1	05/05/2005 19:08	Amanda W Herr	1
07807	BNA Water Extraction	SW-846 3510C	1	05/06/2005 07:00	Mark P Mastropietro	1

\*=This limit was used in the evaluation of the final result

**Lancaster Laboratories Sample No. WW 4517641**

**S38-050305 Grab Water Sample**

**SUN: Philadelphia Refinery AOI-4**

Collected: 05/03/2005 13:45 by MBS

Account Number: 10132

Submitted: 05/04/2005 16:35

Langan

Reported: 05/11/2005 at 16:19

500 Hyde Park

Discard: 06/11/2005

Doylestown PA 18901

S-038

Lancaster Laboratories Sample No. WW 4517642

Trip\_Blank Water Sample  
SUN: Philadelphia Refinery AOI-4

Collected: n.a.

Account Number: 10132

Submitted: 05/04/2005 16:35  
Reported: 05/11/2005 at 16:19  
Discard: 06/11/2005

Langan  
500 Hyde Park  
Doylestown PA 18901

AO4TB

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Units	Dilution Factor
02302	UST-Waters by 8260B						
02010	Methyl Tertiary Butyl Ether	1634-04-4	< 5.	5.	0.5	ug/l	1
05401	Benzene	71-43-2	< 5.	5.	0.5	ug/l	1
05402	1,2-Dichloroethane	107-06-2	< 5.	5.	1.	ug/l	1
05407	Toluene	108-88-3	< 5.	5.	0.7	ug/l	1
05415	Ethylbenzene	100-41-4	< 5.	5.	0.8	ug/l	1
05420	Isopropylbenzene	98-82-8	< 5.	5.	1.	ug/l	1
06310	Xylene (Total)	1330-20-7	< 5.	5.	0.8	ug/l	1

Commonwealth of Pennsylvania Lab Certification No. 36-037

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
02302	UST-Waters by 8260B	SW-846 8260B	1	05/08/2005 16:19	Jason M Long	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	05/08/2005 16:19	Jason M Long	n.a.

\*=This limit was used in the evaluation of the final result

## Quality Control Summary

Client Name: Langan

Group Number: 942136

Reported: 05/11/05 at 04:19 PM

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

## Laboratory Compliance Quality Control

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank LOQ**</u>	<u>Blank MDL</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Batch number: 051250004A Ethylene dibromide	Sample number(s): 4517633-4517641 < 0.030	0.030	0.010	ug/l	100	96	60-140	4	20
Batch number: 051256050003A Lead	Sample number(s): 4517633-4517641 < 0.0010	0.0010	0.00021	mg/l	101		80-120		
Batch number: 05125WAG026 Naphthalene	Sample number(s): 4517633-4517641 < 10.	10.	1.	ug/l	79	78	58-108	2	30
Fluorene	< 10.	10.	1.	ug/l	95	96	61-116	1	30
Phenanthrene	< 10.	10.	1.	ug/l	99	99	68-111	0	30
Pyrene	< 10.	10.	1.	ug/l	91	89	68-114	2	30
Chrysene	< 10.	10.	1.	ug/l	92	93	70-111	1	30
Batch number: P051281AA Methyl Tertiary Butyl Ether	Sample number(s): 4517633-4517642 < 5.	5.	0.5	ug/l	91	89	77-127	2	30
Benzene	< 5.	5.	0.5	ug/l	98	97	85-117	1	30
1,2-Dichloroethane	< 5.	5.	1.	ug/l	92	93	77-132	1	30
Toluene	< 5.	5.	0.7	ug/l	95	95	85-115	0	30
Ethylbenzene	< 5.	5.	0.8	ug/l	94	94	82-119	0	30
Isopropylbenzene	< 5.	5.	1.	ug/l	93	94	80-120	1	30
Xylene (Total)	< 5.	5.	0.8	ug/l	94	95	83-113	0	30

## Sample Matrix Quality Control

<u>Analysis Name</u>	<u>MS %REC</u>	<u>MSD %REC</u>	<u>MS/MSD Limits</u>	<u>RPD</u>	<u>BKG</u>	<u>DUP</u>	<u>DUP</u>	<u>Dup RPD</u>
Batch number: 051250004A Ethylene dibromide	Sample number(s): 4517633-4517641 96		65-135		< 0.029	< 0.029	0 (1)	30
Batch number: 051256050003A Lead	Sample number(s): 4517633-4517641 99		75-125	3	< 0.0010	< 0.0010	34* (1)	20
Batch number: P051281AA Methyl Tertiary Butyl Ether	Sample number(s): 4517633-4517642 96		69-134					
Benzene	110		83-128					
1,2-Dichloroethane	102		73-136					
Toluene	103		83-127					
Ethylbenzene	99		82-129					
Isopropylbenzene	99		81-130					
Xylene (Total)	100		82-130					

\*- Outside of specification

\*\*-This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The background result was more than four times the spike added.

## Quality Control Summary

Client Name: Langan  
Reported: 05/11/05 at 04:19 PM

Group Number: 942136

### Sample Matrix Quality Control

	MS	MSD	MS/MSD	RPD	BKG	DUP	DUP	Dup
<u>Analysis Name</u>	<u>%REC</u>	<u>%REC</u>	<u>Limits</u>	<u>RPD</u>	<u>MAX</u>	<u>Conc</u>	<u>Conc</u>	<u>RPD</u>
								<u>Max</u>

### Surrogate Quality Control

Analysis Name: EDB in Wastewater  
Batch number: 051250004A  
1,1,2,2-  
Tetrachloroethane

4517633	103
4517634	99
4517635	87
4517636	101
4517637	106
4517638	111
4517639	97
4517640	109
4517641	98
Blank	114
DUP	100
LCS	111
LCSD	110
MS	110

Limits: 52-120

Analysis Name: PAHs in Water by GC/MS  
Batch number: 05125WAG026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
4517633	74	78	86
4517634	85	86	90
4517635	83	82	86
4517636	74	83	90
4517637	74	85	91
4517638	76	81	90
4517639	81	88	91
4517640	78	88	90
4517641	75	83	86
Blank	76	81	99
LCS	79	80	101
LCSD	79	81	101

Limits: 51-123 64-112 53-135

Analysis Name: UST-Waters by 8260B  
Batch number: P051281AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
4517633	95	95	96	93
4517634	95	89	98	102
4517635	95	97	100	107

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The background result was more than four times the spike added.

## Quality Control Summary

Client Name: Langan

Group Number: 942136

Reported: 05/11/05 at 04:19 PM

### Surrogate Quality Control

4517636	96	93	97	95
4517637	97	91	97	91
4517638	95	93	93	94
4517639	97	90	98	93
4517640	96	93	96	93
4517641	100	96	97	92
4517642	96	90	97	93
Blank	96	92	97	93
LCS	93	92	97	94
LCSD	95	92	96	96
MS	100	96	96	95
Limits:	81-120	82-112	85-112	83-113

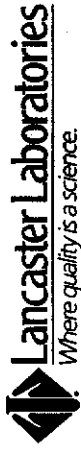
\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The background result was more than four times the spike added.



# Analysis Request / Environmental Services Chain of Custody



For Lancaster Laboratories use only

Acct. # 10132

Group # 942136

Sample # 4517633-42

COC # 0080450

Please print. Instructions on reverse side correspond with circled numbers.

cooler temp 1.4-2.1°C

<b>1</b> Client: <u>Sun - Aquaterra / Lancaster</u> Acct. #: _____ Project Name: <u>Sun - Philadelphia Botany NOT-4</u> PWSID #: _____ Project Manager: <u>K. Martin / J. Harris</u> P.O. #: _____ Sampler: <u>M. Bed Sparake</u> Quote #: _____ Name of state where samples were collected: <u>PA</u>		<b>2</b> Sample Identification Sample ID: _____ Date Collected: _____ Sample Description: _____		<b>3</b> Matrix <input checked="" type="checkbox"/> Composite <input type="checkbox"/> Soil <input type="checkbox"/> Water <input type="checkbox"/> Other: _____		<b>4</b> Total # of Containers: _____ Other: _____		<b>5</b> Analysis Requested 8011 EMB 8270 Dissolved Pb 8270 Chlorine, Phosphate, Nitrate, Nitrogen, Manganese, Molybdenum		<b>6</b> Remarks Dissolved Pb samples are unfiltered/unpreserved	
<b>7</b> Turnaround Time Requested (TAT) (please circle): Normal <u>Rush</u> (Rush TAT is subject to Lancaster Laboratories approval and surcharge.) Date results are needed: <u>5 Day TAT</u> Rush results requested by (please circle): Phone Fax E-mail Phone #: _____ Fax #: _____ E-mail address: _____		<b>8</b> Data Package Options (please circle if required) QC Summary Type VI (Raw Data) Yes <u>No</u> Type I (Tier I) GLP Other Type II (Tier II) Type III (NJ Red. Del.) Type IV (CLP)		Site-specific QC required? Yes <u>No</u> (If yes, indicate QC sample and submit triplicate volume.) Internal Chain of Custody required? Yes <u>No</u>		<b>9</b> Relinquished by: <u>Mr. Brad J. He</u> Relinquished by: <u>Michelle K. Murphy</u> Relinquished by: <u>Marianne M. Hollander</u> Relinquished by: _____ Relinquished by: _____		Date Time <u>5/3/05</u> <u>10:20</u> <u>5/4/05</u> <u>11:15</u> <u>5/4/05</u> <u>16:35</u> Date Time Date Time Date Time			

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>N.D.</b>	none detected	<b>BMQL</b>	Below Minimum Quantitation Level
<b>TNTC</b>	Too Numerous To Count	<b>MPN</b>	Most Probable Number
<b>IU</b>	International Units	<b>CP Units</b>	cobalt-chloroplatinate units
<b>umhos/cm</b>	micromhos/cm	<b>NTU</b>	nephelometric turbidity units
<b>C</b>	degrees Celsius	<b>F</b>	degrees Fahrenheit
<b>meq</b>	milliequivalents	<b>lb.</b>	pound(s)
<b>g</b>	gram(s)	<b>kg</b>	kilogram(s)
<b>ug</b>	microgram(s)	<b>mg</b>	milligram(s)
<b>ml</b>	milliliter(s)	<b>l</b>	liter(s)
<b>m3</b>	cubic meter(s)	<b>ul</b>	microliter(s)
<b>&lt;</b>	less than - The number following the sign is the <u>limit of quantitation</u> , the smallest amount of analyte which can be reliably determined using this specific test.		
<b>&gt;</b>	greater than		
<b>J</b>	estimated value – The result is $\geq$ the Method Detection Limit (MDL) and $<$ the Limit of Quantitation (LOQ).		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

## U.S. EPA CLP Data Qualifiers:

### Organic Qualifiers

<b>A</b>	TIC is a possible aldol-condensation product
<b>B</b>	Analyte was also detected in the blank
<b>C</b>	Pesticide result confirmed by GC/MS
<b>D</b>	Compound quantitated on a diluted sample
<b>E</b>	Concentration exceeds the calibration range of the instrument
<b>N</b>	Presumptive evidence of a compound (TICs only)
<b>P</b>	Concentration difference between primary and confirmation columns $>25\%$
<b>U</b>	Compound was not detected
<b>X,Y,Z</b>	Defined in case narrative

### Inorganic Qualifiers

<b>B</b>	Value is $<CRDL$ , but $\geq IDL$
<b>E</b>	Estimated due to interference
<b>M</b>	Duplicate injection precision not met
<b>N</b>	Spike sample not within control limits
<b>S</b>	Method of standard additions (MSA) used for calculation
<b>U</b>	Compound was not detected
<b>W</b>	Post digestion spike out of control limits
<b>*</b>	Duplicate analysis not within control limits
<b>+</b>	Correlation coefficient for MSA $<0.995$

Analytical test results for methods listed on the laboratories' accreditation scope meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

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